

ABSTRACT OF THE DISCLOSURE

5 A force feedback mouse interface device connected to a host computer and providing realistic force feedback to a user. The mouse interface device includes a mouse object and a linkage coupled to the mouse that includes a plurality of members rotatably coupled to each other in a planar closed-loop linkage and including two members coupled to ground and rotatable about the same axis. Two actuators, preferably electromagnetic voice coils, provide forces in the two
10 degrees of freedom of the planar workspace of the mouse object. Each of the actuators includes a moveable coil portion integrated with one of the members of the linkage and a magnet portion coupled to the ground surface through which the coil portion moves. The grounded magnet portions of the actuators can be coupled together such that a common flux path between the magnet portions is shared by both magnets. At least one sensor is coupled to the ground surface that detects movement of the linkage and provides a sensor signal including information from
15 which a position of the mouse object in the planar workspace can be determined.